

WHAT IS CLAIMED IS:

1. A process control instrument for coupling to a process, the process control instrument being attachable to a metal flange having a first passageway adapted to be filled with process fluid, the process control instrument comprising:

a body having an opening adjacent to the first passageway for receiving process fluid from the first passageway when the process control instrument is attached to the flange; and

a diaphragm disposed across the opening for fluid communication with the process fluid;

a seal adapted to be positionable against the flange to prevent process fluid from leaking past the flange and diaphragm, where the seal comprises a ring positioned in the opening and coupled to the body, the ring being substantially in contact with the diaphragm along an inner annular shoulder when the body is not attached to the flange (unloaded).

2. The apparatus of claim 1 wherein the seal includes a taper along an exterior annulus portion.

3. The apparatus of claim 1 including a fill material in the seal.

4. The apparatus of claim 1 wherein the seal is welded to the body.

5. The apparatus of claim 4 wherein the weld comprises a laser weld.

6. The apparatus of claim 1 including a flange configured to load the seal.

7. The apparatus of claim 6 wherein a sealing force which couples the flange to the body causes deformation of the seal from an unloaded state.

8. The apparatus of claim 7 wherein deformation occurs along a gap between an exterior annulus and the body.

9. The apparatus of claim 8 wherein the deformation is a direction away from the surface of the flange.

10. A method of attaching a seal to a process transmitter, comprising:

    preload the seal to urge an inner annular portion of the seal against an isolation diaphragm of the transmitter;  
    attaching the seal to the transmitter while applying the preloading; and

removing the preloading following the attaching whereby an annular shoulder of the seal remains in contact with the diaphragm.

11. The method of claim 10 wherein the seal includes a taper along an exterior annulus.

12. The method of claim 10 including placing a fill material in the seal.

13. The method of claim 10 wherein attaching the seal comprises welding.

14. The method of claim 13 wherein the weld comprises a laser weld.

15. The method of claim 10 including applying a flange configured to load the seal.

16. The method of claim 15 wherein a sealing force which couples the flange to the body causes deformation of the seal from an unloaded state.

17. The method of claim 16 wherein deformation occurs along a gap between an exterior annulus and the body.

18. The method of claim 16 wherein the deformation is a direction away from the surface of the flange.

19. A process transmitter including a seal attached in accordance with the method of claim 11.